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ABSTRACT

Trends in information policy are discussed as they impact on cartographic information, stressing particularly the relationships between cartographic communication, documentation, and policy making. Distinction is made between cartographic communication as a subject for information policy and cartographic communication as an expedient in public policy making. (RAA)

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CARTOGRAPHIC COMMUNICATION AND INFORMATION POLICY

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Introduction.

This paper stresses particularly the relation between cartographic communication, documentation and policy making. Concerning the latter, a distinction is made between cartographic communication as a subject of information policy, and cartographic communication as an expedient in public policy making. Some recent developments in the field of information policy and their impact on cartographic information will be discussed. In many countries an information policy is being decided on at the moment. Organisational and legal measures are being taken which are also important to cartographers. All this is happening now, because it has been proved that only a well-organised policy gives solutions for the co-ordination of all different measures taken to master the enormous demand for and supply of information. The problems can not be solved without a high degree of automation, and automation implies that we must seek to work in and with bigger entities by co-operation. Only then will expensive investments prove to be rewarding and will we be able to use the means of communication in a better way.

In a previous article "Documentational aspects of cartographic materials"[1] I started from the principle that cartographic processing and documentation are parts of the same process, aiming to supply users with information. Special attention was paid to marginal information, as it involves both the documentalist and the cartographer. I also expressed the hope that the International Cartographic Association should join the initiative of the Geography and Map Libraries Section of the International Federation of Library Associations, to establish an interassociational working group for the documentation of cartographic materials. It is very gratifying to report that this working group will have its first meeting in Tokyo during the ICA-conference. This conference will take place immediately after the IFLA-meeting in Manila.
Policy making is a complex process and can not be compared to subjects that are fit for immediate action and speedy results, such as marginal information or documentational terms in the Multilingual Dictionary of Cartographic Terms. A policy is subjected to a much more complicated incubation. Still, it is useful to point out some important matters, related to developments in information policy, that will surely affect cartography. The article concludes with an enumeration of consequences and recommendations for a policy concerning cartographic communication.

1. Some trends in information policy.

To begin, let us consider the definition of "information", used by the Dutch Organisation for Information Policy (NOBIN) in its recommendations to the Minister of Science in 1978[2].

> "Information is all data, that
> - are rendered or can be rendered in alpha-numeric characters and/or graphical images,
> - can be stored and retrieved when desired,
> - are relevant to one or several branches of society, or can contribute to the realisation of data that are relevant.
>
> The relevancy is mainly in the fact that these data, detached from their sources, (can) have independent meaning within the differing branches and sectors of society (e.g. science at large, technology, industry etc.)."

It needs no explaining that all kinds of cartographic documents fit this description. They will have to be included in the information policy, defined as:

"To (make) perform actions with all appropriate means, in order to stimulate an optimal functioning of the whole process of information supply from source to user, to serve the following two purposes
- to advance the realisation of new or derivative information,
- to avoid the creation of not functional (redundant) information."

For some decennia now, governments have shown a growing interest in information policy. It does not matter whether the political system is centralised or decentralised, the supply of and need for information is so enormous, important and expensive that no country can permit a haphazard way of dealing with the problem. Every country has something like a board, a committee or an interdepartmental commission to deal with information policy.
It is obvious that the documentalist, the link between informational document and reader, is most directly a party in information policy. The result is that it is particularly libraries who are involved. Still, they are only links in the complex of information supply. In the last paragraph the whole process, from data collection via cartographic processing and cartographic document to the user is mentioned. Here, only the most important trends, relevant to most stages of the process, will be discussed.

Supply of and need for information are closely related to social and technical factors. In this connection, all information suppliers are called documents, books as well as gramophone records. There is a strong mutual dependency between possibilities and demands. I will discuss only a few facets of the information policy, resulting from social and technical factors that will not be discussed in full as this article is hardly the place to do so.
The rapid growth of the number of information suppliers is one of the most important social causes of information policy, whereas the electronic attainments, resulting in ever more sophisticated possibilities for data storage and data communication, are the most important technical causes.
For all kinds of co-operation it is of utmost importance to create an organisational structure and a division of work that makes realisation of communal goals possible. For the information policy this means the creation of a national centre for data communication, which can also provide an international sharing of information, based on telecommunication and linking together of several data bases. To this end a high degree of uniformity of data is needed, but yet not to the point of frustrating the users of the system. Standardisation of bibliographic descriptions on a national and international level will ensure that data are exchangeable, according to for instance ISBD[3]-rules and UNIMARC[4], which gives directives as to how to construct the contents of the magnetic tapes.
It is impossible to make rules that will result in uniform bibliographic descriptions, but still duplication of work has to be avoided. This explains the necessity of having national centres in all countries, which are responsible for the production of bibliographic descriptions of all that has been published in that country (national bibliographies). This is realised within the National Bibliographic Agencies.

Because of the diversity of the materials, it is quite conceivable that for the different kinds of documents different institutions will be created. Integrated in the larger structure, they can occupy themselves with special types of documentation or specific fields of interest. Already existing are specialised literature databanks for e.g. medicine, chemistry and agriculture. Next to centralising trends, we observe a tendency to create specialised institutions.
This tendency is related to the historicallly determinated location of

collections; some highly specialised collections have come into being. Though also here co-ordination and co-operation are mandatory to use the (always limited) means and possibilities effectively, it does not seem advisable to move well-functioning and well-organised institutions with their very specific outfit and knowledge. Developments in data communication, which will be accelerated with the introduction of chips, make a geographical concentration unnecessary and even undesirable.

Concerning standardisation it has been stated before that it is impossible to frame rules sufficiently precisely to ensure uniform descriptions. It is not true that correct application of a set of rules leads automatically to a standard description. It is also necessary to have them made by an authorised institution. Those fixed by the national bibliographic agency are the standard descriptions.
Beside the bibliographic description, serving to identify the document, the entries are important, too. These are the subjects, titles and names that can be selected from the data base. They are the entries to retrieve specific documents or subjects. Here too, uniformity is desirable. It is to be expected that the IFLA, next to the ISBD's, will frame rules to unify the ways to choose entries and to put them onto magnetic tapes. Preparations have been started and an international clearing house for MARC-tapes is planned in Stuttgart. Here UNIMARC-tapes containing descriptions with authorised entries will be exchanged.

Another trend that could be observed in a number of countries for some years now, is cataloguing in print. This means that the reverse of the title page of books contains a complete bibliographic description. Often, also the entries (e.g. the code according to the Universal Decimal Classification) and the registration number in the national bibliography (e.g. de Library of Congress cardnumber for the United States) have been recorded. Automation effects also the production of books and all kinds of administration that accompany a book through the distribution system till it reaches its place on the shelf. During this process it receives several codes, for instance the ISBN-code which is allocated per country, publisher and sequence.

The information policy is so important socially and has so many facets that it needs a legal basis. It is necessary to have laws concerning the creation of information (e.g. copyright difficulties), and regulating the effectuation of collections and legal depositories where one copy of all publications has to be deposited. Provisions have to be made for education and training, so that professional specialists in information can be trained. Consequences for cartographic information will be discussed in the last paragraph.

2. Cartographic communication.

The cartographer gives a representation of one or several phenomena related to their exact location, which implies that he uses a certain scale. He is primarily concerned that his cartographic message is clearly understandable to his public. Cartography is sometimes compared to a language of symbols where cartographic renderings are subjected to grammatical rules and where cartographic symbols must depict phenoma unambiguously.

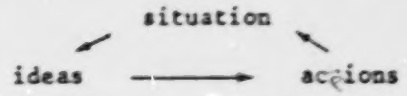
As the human being has only limited comprehension, it is necessary to generalise and to omit unnecessary details. Another possibility is to specify the differing aspects of a phenomenon, but then a situation is soon reached where it is no longer possible to see the wood for the trees. With maps, it is possible to choose different scales (levels of generalisation) and to focus on the trees or on the wood and even on relations to other woods.

The possibilities for making several thematic maps representing several phenomena, at the same scale, are practically unlimited.
A purely natural ecological system is in a certain balance. This balance nowadays is very often disturbed as a result of human actions. It is of vital importance that we follow the consequences of our actions closely, and that we even look for them in fields where no one would expect to find them. Fortunately the developments in cybernetics enable us not only to cause changes, but also to measure and control them and to draw conclusions from them.
Here we are confronted with another problem. A human being can choose between knowing a lot about a specific field, or knowing a little about many fields. It is the specialists who carry out the general policy, but what is to be done in all cases that also require specialistic knowledge of other disciplins? The solution is obvious, a team of experts is set up to integrate the different subjects of the policy. Apart from the problem of who should be on the team (it must not be too large), there is the difficulty of communication between the members of the team. Several fields of science and technology have specific interests, methods, behaviours and jargons, to such an extent even that they can become objects of charicature. It is a well-known complaint of economists that they would like to use the results of sociological studies, but that this is impossible because sociologists tend to be very vague about subjects that are not immediately important to them. On the other hand, sociologists find that economists do not give answers to their questions. They may both be right, but it is certainly true that communication grows more difficult with the number of experts involved. Even if they sincerely wish to co-operate constructively (which is not always the case), the fact remains that human comprehension is limited, and so the problem must be put before them in a comprehensible way. This may be done by presenting them with a generalised image and to give them no more details than necessary for the level of generalisation (scale). Also, the complex phenomenon can be split into parts, so that an analysis is possible. It goes without saying that statistical methods, factor analysis and models are useful expedients, but in all cases where phenomena have a spatial component cartographic documents are the material to engender communication.
With a little exercise anyone can learn to interpret a map, though this also depends on the quality of the cartographic rendering. The same goes for other cartographic materials, such as models, aerial photographs and multi spectral scanning images. A slight difference is that maps are a finished product, influenced by data collectors and mapmakers, which makes them easier to interpret. Aerial photographs and scanning images are the raw material, only influenced in so far as the choice of the image creating apparatus and scale imply a certain processing.

3. Cartography and public policy making.

In the first paragraph we have considered the aims of an information policy, of which the cartographic information is a part. In this paragraph we will raise the matter of what could be subjects of a policy in cartography.
There is yet another relation between policy making and cartography, namely the application of cartographic documents in the general policy that has to guide developments in a country. Every government tries to guide the process of growth and the solution of problems via a systematic approach. Because so many phenomena are involved, this planning always has a comprehensive character, and many integrational problems occur. From the previous paragraph it will be clear that cartographic documents particularly can help to solve the integrational problems. On the basis of the factors involved in a comprehensive planning, the suitability of maps can be discussed further. We can

observe three basical elements in the purposive intervention in a situation. The relations between the elements is sketched in the following figure[5]:



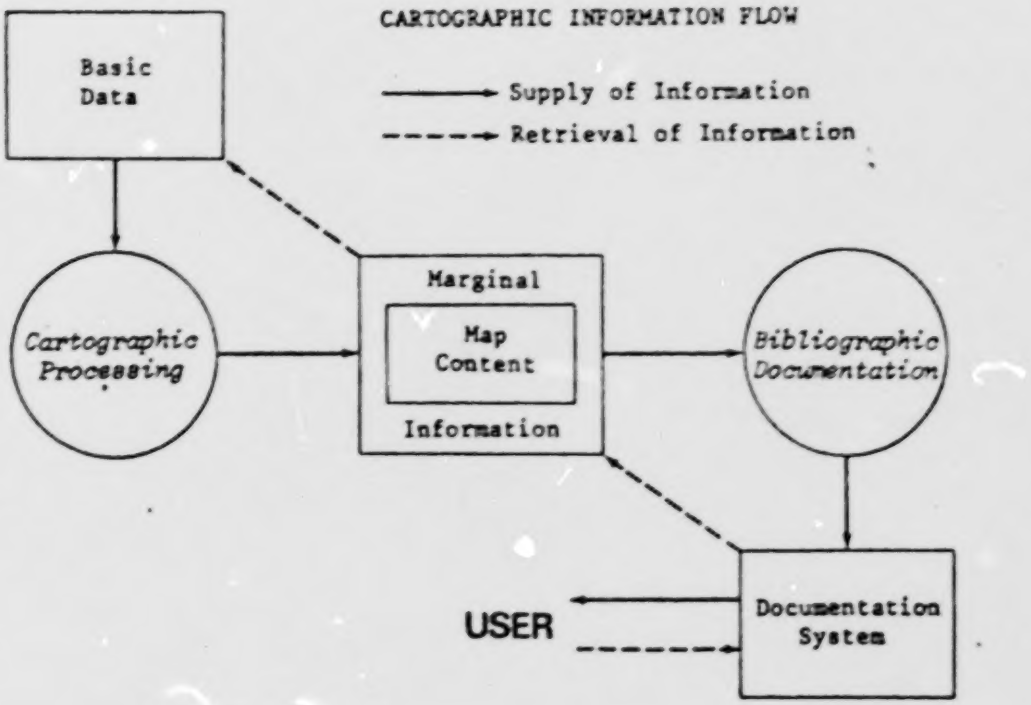
We start from a given situation, about which we have certain ideas and an image for the future, which we hope to realise via actions.
A clear directive and a strategy to match, make these actions into a systematic planning. Let us consider planning at the national level. For a national plan we need highly generalised data about a very large number of subjects. Traditionally these are obtained by generalisation of collected base data. Maps have always played an important part in this process; viz. the national atlases. With the existence of aerial photographs, it became possible to have a general view of situations which were hitherto too immense to be analysed. It is obvious that there is a strongly causal relation between the development of aerial photograph interpretation, integrated surveys and multi-sectoral planning. Modern remote sensing methods, however, enable us to record much bigger parts of the earth in greater detail and parts of the spectrum that are invisible to the human eye. With maps we can omit details and make an image on a high level of generalisation; by means of remote sensing methods we can record data at the desired scale directly. This is important because planning suffers from a chronic lack of time. Some matters, such as the growth of agricultural crops and environmental pollution, require frequent measurement of the situation and rapid processing of the resulting data into useful interpretations. This explains the great interest in methods that store localised data in a digitised form. These methods are already being used in practice for meteorology and agricultural prognoses.
Apart from the fact that certain phenomena are subject to rapid changes, a systematic policy requires the possibility of checking if its actions have the results that were desired. This is necessary for a timely feed-back. Planners tend to be more interested in the future outcome of their plans, than in the effects that these have in the meantime; which corresponds with the impossibility of obtaining the necessary data quickly enough. It will be clear that in the process of data collection and the recording of the situation cartographic documents could be of useful assistence.

So far we have discussed policy making on a high level. The aim of the policy, however, is to affect changes at the base, where the policy will have to be effectuated. On this level it is mandatory that the generalised data be made more specific again. An intermediate stage is the regional planning Level, the ultimate level where the policy is being realised, is local level. Cartographers can cater for all these levels via different scales: for the national level maps on a small scale, for the regional level maps on a scale 1:250 000 and for the local level maps on scale 1:25 000 or even bigger.
As there is an ever growing need to observe the changes on this planet frequently and with another kind of interest than only the military kind, it can be expected that cartographic documents have a great future before them, in spite of difficulties that will accompany their operational use. Especially concerning the protection of privacy of states and individuals many problems have yet to be solved. Also, the mutual adaptation of technology and organisation in the realisation of policies will have to evolve. Finally, a lot of work is still to be done in creation of interpretational keys and processing apparatus, in order to speed up the realisation of the finished cartographic product.

4. Consequences for policy making in cartography.

This article is written in general terms and does not contain much that has not been said before; it is mainly meant to serve the purpose of stressing the important social task of cartographic documentation. There is always a danger of being too much absorbed in the daily troubles of one's own limited tasks. This is dangerous for the cartographer, because at the moment important legal and organisational developments are occurring in information policies, as well as in public policy making, which will have consequences for the future of his profession. Information policy is a clearly contemporary occurrence, but also in the field of the somewhat older comprehensive public policy making many things are effectuated now, for instance the set-up of regional planning departments.
Cartography has known a rapid growth since World War II, but in spite of (or: because of) the ever growing output, the creation of a fundamental policy and organisational system have rather been neglected. The post-war pioneers have grown older or became preoccupied with their own activities, the younger generation does not yet stand on its own feet. But if cartography does not join in the general information policy in the near future, an opportunity will be missed which will be difficult to recover.

Let us have a look at the flow of information from basis data to the user of cartographic documents, and see what could be obvious policy actions in the view of developments discussed in the previous paragraphs.



Data collection does not really belong to cartography, nevertheless it is of vital importance, and a well-organised and institutionalised co-operation is mutually useful. The contact can be hampered by a selective directedness towards one's own field, but cartographers have a special duty here as they are closer to the user. A better co-operation is needed with photogrammetrists and remote sensing specialists, including also specialists in other fields that have no such traditional relations with cartography. It is conceivable that statisticians, physicians, agriculturists etc., relate their data to locations, so that e.g. computermaps may be produced.

Concerning cartographic production, it will be necessary to try and arrange the position of cartographic documents legally or by agreement. Traditionally, land directories are legally required to have maps, but in some countries this rule is also applied to regional and local planning. Certain subjects, such as geology, soil and vegetation, belong to the standard inventories which most countries consider to be indispensable. Now that environment and planning are so much to the fore, there are more possibilities. One need only consider the gigantic assignment to produce the Land Inventories Maps in Canada. Also, there are countries that have no national or regional atlases yet, nor surveys of their pipe-line systems. Topographical series are often still looked upon as military cartography. The Institut Géographique Nationale in France shows what possibilities emerge when national surveying and mapping loses this atmosphere. Maps and related documents belong to the most important constituants of the infra structure.

Another important task is to make application, trading and documentation of maps easier. For the application it would be useful to improve the legend and the description of the map's contents. Many carefully made maps lose much of their value, because the legend is incomplete or much too complicated. In my previous article I elaborated on the improvement of the marginal information and here I would like to support the idea af an International Standard Book Number. This would especially facilitate the administrative accompaniment of all intermediate stages between producer and user. In most countries ISBN's are being used successfully and there is no reason to believe that these numbers would not function for cartographic documents as well. In the Netherlands the ISO Working Group on Document Codes will study the possibilities for the development of an International Standard Cartographic Number, now that recommendations concerning an International Standard Record Code for sound recordings and audible information have been drafted. As long as the ISCN does not yet exist, it is allowed to use ISBN's for cartographic documents. They are allocated per country and per publisher by national ISBN-Agencies. Information about this new development can be obtained from the national standardisation institutes. They can no longer claim that maps can not receive ISBN's, for these numbers are no longer meant for books exclusively and are applied to many kinds of printed information. In expectation of the ISCN's the International ISBN-Office in Berlin will advise its national agencies to allocate ISBN's to maps as well. ISSN's (International Standard Serial Number) are not applicable to cartographic documents, because proper series, issued periodically like book-series and periodicals, are extremely rare in cartography. This matter is treated further in the ISBD(CM).
ISBN's are becoming very important now that distribution and administration are being automated. In the United States, big department stores sell only articles provided with a Universal Product Code. The function of this code is comparable to the function of an ISBN, but it is also provided with a product indication in the shape of a bar code, readable for an optical reader. In Europe a similar European Article Code is gaining in importance. For published documents the ISBN, in the shape of a bar code, will be a part of this general code.

Concerning documentation, I will confine my remarks to the political and organisational aspects. It is important that cartographic documents take their place in the regulations that are being arranged for information supply. Compared to the bulk of literature and documentation, cartographic documents are a small part that could be overlooked. The common characteristics have to be taken into account, as well as the particular cartographic traits and needs. It is not necessary to play a passive role, it is certainly possible to be just a little ahead because the interests and costs are not so immease. Publication of national bibliographies for maps and the realisation of specialised map collections with catalogues, set up with the co-operation of national bibliographic agencies, would be things to start with. Cartographic documents should be part of large literature data bases and systems built for the retrieval of documents and information. In the latter systems especially the retrieval possibilities for locations are mandatory. Beside the possibility to retrieve via co-ordinates and scale, a system of entries for regions should be developed. I will not go into this matter now: an article is being prepared at the Dutch Union Map Catalogue, concerning its experience in this field. To cartographers it will be a relief to know in advance that the spelling of geographical names is of minor importance with this system: the names will be coded and put into a hierarchic structure.

When a professional approach to a certain problem is needed, training and education are prerequisites. This concerns not only cartographic production, but also the application of maps which should be included in the general education. Cartographers and map librarians could both stimulate the realisation of the specialism "cartographic documents" in library and documentation courses. In this respect the activities of the Section of Geography and Map Libraries can be mentioned. In 1981 a workshop for Practical Mapcuratorship in Developing Countries will be held in Utrecht, the Netherlands. A Manual for Practical Mapcuratorship is in preparation.
Map producing institutions could appoint map curators and map documentalists on salaries that would attract and hold capable and knowledgeable people. The latter could help to solve the problems concerning marginal information. Some map producers have organised courses on application of maps that were very succesful. Producers can supply demonstrative material cheaply and without too many problems, as e.g. I.G.N. and Hunting do.

Summarising, I hope to have been succesful in calling attention to maps and other images of the earth on scale in their role as documents. In this status they belong to the several kinds of information policy. It is gratifying that the first meeting of the ICA-IFLA Working Group will take place in Tokyo in september 1980, during the conference of the ICA (International Cartographic Association). This working group offers an opportunity to combine the efforts of both associations in the field of supplying information by means of cartographic documents.

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